AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A thermal insulation system, comprising:

at least one flexible insulating layer, wherein said at least one flexible insulating layer is conformable to three-dimensional surfaces of an object to be insulated, and comprises:

a reflection layer having a first surface and second surface and formed of a material selected from a group consisting of metal foils and metalized foils;

~~a spacer layer adjacent the first surface of the reflection layer, wherein said spacer layer further comprises:~~

a carrier layer formed of a low thermal conductivity material selected from a group consisting of microglass, paper, fabric, polyester fabric and Q-fiber fabric; and

a fill layer located between the carrier layer and the first surface of the reflection layer and containing powder having a compressed density of approximately 1 to 10 times a bulk density of the powder.

2. (Original) The thermal insulation system of claim 1, wherein the powder has a surface area of approximately 10 to 1,100 m^2/g of powder.

3. (Original) The thermal insulation system of claim 1, wherein the bulk density of the powder is less than approximately 4 lb_m/ft^3.

4. (Previously Presented) The thermal insulation system of claim 1, wherein the powder is contained on a carrier layer.

5-7. (Cancelled)

8. (Original) The thermal insulation system of claim 1, wherein the powder is a silica selected from the group consisting of fumed silica and silica aerogel.

9. (Cancelled)

10. (Currently Amended) The thermal insulation of claim 1, wherein ~~each spacer~~ a combination of said fill layer and said carrier layer has a thickness of approximately 0.002 to 0.20 inches.

11. (Original) The thermal insulation system of claim 1, further comprising:

an outer casing surrounding the at least one flexible insulating layer.

12. (Currently Amended) A thermal insulation system, comprising:

a plurality of similarly constructed, adjacently disposed flexible insulating layers, wherein each of said plurality of flexible insulating layers is conformable to three-dimensional surfaces of an object to be insulated, ~~and~~ wherein each flexible insulating layer comprises:

a reflective layer, having a first surface and second surface and formed of a material selected from a group consisting of metal foils and metalized foils,

a carrier layer formed of a low thermal conductivity material selected from a group consisting of microglass, paper, fabric, polyester fabric and Q-fiber fabric;

a fill layer adjacent the first surface of the reflective layer and interposed between the carrier layer and the reflective layer, wherein the fill layer contains powder having a compressed density of approximately 1 to 10 times a bulk density of the powder; and

at least one edge strip adjacent ~~the~~ to each fill layer and interposed between ~~the~~each carrier layer and ~~the~~ adjacent reflection layer.

13. (Currently Amended) The thermal insulation of claim 12, further comprising:

said at least one intermediate strip interposed between the carrier layer and the reflection layer~~, wherein the at least one intermediate strip~~ separates sections of the fill layer.

14. (Original) The thermal insulation system of claim 12, further comprising:

an outer casing surrounding the at least one flexible insulating layer.

15. (Original) The thermal insulation system of claim 12, wherein the carrier layer or a first flexible insulating layer is the reflection layer of an adjacent flexible insulating layer.

16. (Original) The thermal insulation system of claim 12, wherein each combination of a fill layer and its adjacent carrier layer has a thickness of approximately 0.002 to 0.20 inches.

17. (Withdrawn) A method of insulating an object, comprising:

applying a thermal insulation system to the object, wherein the thermal insulation system comprises:

at least one flexible insulating layer, wherein each flexible insulating layer comprises:

a refection layer, having a first surface and second surface; and

a spacer layer adjacent the first surface of the reflection layer, wherein the spacer layer contains powder having a compressed density of approximately 1 to 10 times a bulk density of the powder; and

applying an operating pressure to the thermal insulation system, wherein the operating pressure is below about 760 torr.

18. (Withdrawn) The method of claim 17, wherein the operating pressure is below approximately 50 torr.

19. (Withdrawn) The method of claim 17, wherein the operating pressure is in the range of approximately 1 torr to 10 torr.

20. (Withdrawn) A method of insulating an object, comprising:

applying a thermal insulation system to the object, wherein the thermal insulation system comprises:

at least one flexible insulating layer, wherein each flexible insulating layer comprises:

a reflection layer, having a first surface and a second surface;

a carrier layer;

a fill layer adjacent the first surface of the reflection layer and interposed between the carrier layer and the reflection layer, wherein the fill layer contains powder having a compressed density of approximately 1 to 10 times a bulk density of the powder; and

at least one edge strip adjacent the fill layer and interposed between the carrier layer and the reflection layer; and

applying an operating pressure to the thermal insulation system, wherein the operating pressure is below about 760 torr.

21. (Withdrawn) The method of claim 20, further comprising:

at least one intermediate strip interposed between the carrier layer and the reflection layer, wherein the at least one intermediate strip separates sections of the fill layer.

22. (Withdrawn) The method of claim 20, wherein the thermal insulation system further comprises:

an outer casing surrounding the at least one flexible insulating layer.

23. (Withdrawn) The method of claim 20, wherein the operating pressure is below approximately 50 torr.

24. (Withdrawn) The method of claim 20, wherein the operating pressure is in the range of approximately 1 torr to 10 torr.

25. (Withdrawn) A method of fabricating a thermal insulation system, comprising:

distributing a powder across a first surface of a reflection layer at an application rate, thereby producing a fill layer adjacent the first surface of the reflection layer;

applying a carrier layer on the fill layer, thereby producing a spacer layer comprising the carrier layer and the fill layer; and

compressing the reflection layer and spacer layer such that the powder has a compressed density of approximately 1 to 10 times a bulk density of the powder;

wherein the application rate of the powder is sufficient to produce a thickness of the spacer layer of approximately 0.002 to 0.20 inches subsequent to compressing the reflection layer and spacer layer.

26. (Withdrawn) The method of claim 25, further comprising:

producing additional spacer layers on additional reflection layers prior to compressing to produce a plurality of flexible insulating layers.

27. (Withdrawn) The method of claim 25, wherein the powder is a silica selected from the group consisting of fumed silica and silica aerogel.

28. (Withdrawn) The method of claim 25, wherein the reflection layer is selected from the group consisting of metal foils and metalized films.

29. (Withdrawn) The method of claim 25, wherein the reflection layer is selected from the group consisting of aluminum foil and aluminized polyester film.

30. (Withdrawn) The method of claim 25, wherein the application rate of the powder is sufficient to produce a thickness of the spacer layer of approximately 0.002 to 0.20 inches subsequent to compressing the reflection layer and spacer layer.

31. (Withdrawn) The method of claim 25, wherein the application rate of the powder is sufficient to produce a thickness of the spacer layer of approximately 0.05 inches subsequent to compressing the reflection layer and spacer layer.

32. (Withdrawn) The method of claim 25, further comprising:

applying an outer casing on the spacer layer prior to compressing the reflection layer and spacer layer;

wrapping the outer casing around the reflection layer and spacer layer; and

seaming the outer casing.

33. (Withdrawn) A method of fabricating a thermal insulation system, comprising:

distributing a powder across a first surface of a reflection layer at a first application, thereby producing a fill layer adjacent the first surface of the reflection layer;

removing powder from the fill layer, such that remaining powder has a second application rate;

applying a carrier layer on the fill layer, thereby forming a spacer layer comprising the carrier layer and the fill layer; and

compressing the reflection layer and spacer layer such that the powder has a compressed density of approximately 1 to 10 times a bulk density of the powder;

wherein the second application rate of the powder is sufficient to produce a thickness of the spacer layer of approximately 0.002 to 0.20 inches subsequent to compressing the reflection layer and spacer layer.

34. (Withdrawn) The method of claim 33, further comprising:

producing additional spacer layers on additional reflection layers prior to compressing to produce a plurality of flexible insulating layers.

35. (Withdrawn) The method of claim 33, further comprising:

applying an outer casing o the spacer layer prior to compressing the reflection layer and spacer layer;

wrapping the outer casing around the reflection layer and spacer layer; and

seaming the outer casing.

36. (Original) The thermal insulation system of claim 1, wherein the k value of the thermal insulation system is approximately 0.09 mW/m-K at below about $1x10^{-4}$ torr and approximately 2.4 mW/m-K at approximately 1 torr, for insulation having an approximately one inch thickness and boundary conditions of 77K and 290K.

37.. (Original) The thermal insulation system of claim 12, wherein the k value of the thermal insulation system is approximately 0.09 mW/m-K at below about $1x10^{-4}$ torr and approximately 2.4 mW/m-K at approximately 1 torr, for insulation having an approximately one inch thickness and boundary conditions of 77K and 290K.